

W5YI

Nation's Oldest Ham Radio Newsletter

REPORT

Up to the minute news from the world of amateur radio, personal computing and emerging electronics. While no guarantee is made, information is from sources we believe to be reliable. May be reproduced providing credit is given to The W5YI Report.

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FCC AFFIRMS AMATEUR USE OF 219-220 MHZ COMMISSIONER QUESTIONS ENFORCEMENT CAPABILITY

On March 22, 1996, the Federal Communications Commission finally released an Order affirming the secondary allocation of the 219-220 MHZ band for use by the Amateur Radio Service.

The allocation had been challenged by Fred Daniel doing business as Orion Telecom, a licensee in the Automated Maritime Telecommunications Systems. AMTS is a ship-to-shore communications service operating along the U.S. coast and on its inland waterways.

The Order was originally adopted on Jan. 25 but release was held up pending completion of a statement concerning FCC downsizing and its impact on radio service enforcement by Commissioner James H. Quello. We preliminarily covered this FCC action in our W5YI Report of Feb. 15.

Quello, like FCC Chairman Reed Hundt, is a Democrat. One would think that members of the same political party would stick together, but such has often not been the case at the FCC. Quello has been an outspoken critic against the recent closing of more than half of the Commission's field offices and discontinuing radio frequency monitoring on a regional level.

Background of the proceeding

The American Radio Relay League requested additional 1 1/4 meter spectrum between 216 and 220 MHZ to help compensate the Amateur Service

for the loss of 220 to 222 MHZ which was reallocated to narrowband business communications. The spectrum would be used for digital packet "backbone" message forwarding networks. The FCC eventually agreed to allow the Amateur Service to share one megahertz of spectrum on a secondary basis between 219 and 220 MHZ.

The 216-218 MHZ and 219-220 MHZ frequency bands are currently allocated on a primary basis to the Maritime Mobile Service for AMTS. Coast stations are assigned frequencies in the 217-218 MHZ range and ship stations are assigned frequencies between 219-220 MHZ. Coast station frequencies in the 216-217 MHZ band are currently not assigned.

Proposed amateur use of 219-220 MHZ

A message forwarding system is a group of amateur stations participating in a voluntary, cooperative, intercity arrangement where communications from the control operator of an originating station are transmitted to one or more destination stations via forwarding stations, which may or may not be automatically controlled.

Packet radio systems transmit digital data in groups or "packets" using a specific format. Radio channels used by these systems are occupied only during the time individual "packets" of data are actually being transmitted. Upon completion of a

transmission the channel becomes available for other traffic.

Ham operators use packet radio for transmitting a variety of messages, computer programs, graphic images and data bases. The use of the free ham bands offers a very big advantage since additional costs charged by service providers and telephone companies are eliminated.

An advantage to the public is that these systems can also be used in times of emergency, disaster or war to efficiently carry a large volume of messages when other communications facilities are out of service or overloaded. Amateur radio operators use special wideband packet radio networks to provide intercity links for their packet radio systems.

The FCC said they believed that a secondary allocation at 219-220 MHz would serve the public interest by

- 1) relieving congestion that exists in the 222-225 MHz band in certain geographic areas;
- 2) encouraging the development and implementation of regional and/or nationwide digital message forwarding system networks that can be used for emergency and national defense communications purposes;
- 3) facilitating connection of local packet modes to form such regional and nationwide networks; and
- 4) providing spectrum for exploration of new technology related to these purposes.

The FCC requires amateur packet stations operating between 219-220 MHz to notify both AMTS licensees when their operation is within 400 miles of an AMTS coast station and the ARRL who has agreed to maintain a database of amateur 219-220 MHz operations to facilitate coordination and interference resolution. No amateur packet station may operate within 50 miles of an AMTS station without their written approval.

Furthermore, no amateur station may cause interference to any radio service holding a primary allocation at or adjacent to the 219-220 MHz band including AMTS, TV channel 11 and 13, IVDS (the new Interactive Video and Data Service) or the Land Mobile (business) band operating at 220-222 MHz.

Objections to 219-220 MHz amateur access

Orion Telecom, Inc., believes that the rules should provide protection to AMTS under all conditions. They said they are particularly concerned that areas with the greatest demand for additional amateur spectrum are in urban areas near waterways where AMTS may be provided.

While acknowledging that amateurs do indeed need additional spectrum for digital message forwarding systems, Orion does not believe amateurs should share frequencies that are the most likely to have active AMTS systems. They said the "allocation of this band on a secondary basis is not practical and should be rescinded."

The FCC decision on 219-220 MHz.

The FCC denied Orion's requests stating that it believes that "it is appropriate and desirable to provide a secondary allocation for amateur point-to-point fixed digital message forwarding systems at 219-220 MHz."

The FCC further believes that the 50 mile "exclusion zone" and 400 mile "notification distance" are sufficient to protect AMTS operations from interference caused by amateur stations.

The FCC acknowledged that a propagation phenomenon called tropospheric ducting can occur which may cause VHF signals to travel substantial distances. This, however, would be the extreme exception.

The Commission also refused to limit the power levels depending upon the channel bandwidth or to require that the amateur equipment used at 219-220 MHz be type accepted as required of AMTS equipment.

"Amateurs have an exemplary record of interference avoidance with other services," FCC added.

Commissioner issues separate statement

FCC Commissioner James Quello said he fully supported the secondary allocation of 219-220 MHz to the Amateur Radio Service. "Shared frequency bands are an inevitable result of escalating demands for spectrum to provide innovative advanced communications services while maintaining critical and productive existing services," he said. "It is incumbent upon both this agency and our licensees to acknowledge this and strive toward more flexible and efficient spectrum management and usage..."

Commissioner Quello took the opportunity, however, to criticize the FCC's new policy of massive restructuring, streamlining and privatization of many of its functions...especially in the area of radio wave monitoring and interference resolution. He is particularly disturbed about recent Commission action which closed many of its FCC field offices and reduced its engineering staff.

Quello said, "First, we starve the relevant offices by diverting resources elsewhere which decimates the ranks of qualified technical personnel; then, we castigate those remaining as not up to the task, and propose doing away with the function. This is an archetypal example of 'blaming the victim.' I find it not only distasteful for its effect on morale but counterproductive and, perhaps, most importantly, impermissible without significant changes in our statutory mandate."

"I have written at length because of my profound concern that we not cease performing our core function of interference prevention through monitoring and interference resolution through enforcement while simultaneously adopting spectrum management policies and rules authorizing flexible usage in shared frequency bands..."

"Radio frequency interference will inevitably occur in shared bands in a congested radio frequency

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environment despite the best efforts of the operators. The purpose of our rules is to minimize its occurrence and deleterious effects."

"The means by which we accomplish this is through the monitoring and enforcement efforts of our technical staff. I do not want to have to say, 'I told you so,' when we are unable to respond to interference complaints in the 219-220 MHz and other shared bands."

STS-76 SHUTTLE SPACE MISSION ENDS ALL SAREX SCHOOL CONTACTS RESCHEDULED

Silver Spring, MD (March 31, 1996) The Space Shuttle Atlantis successfully lifted off a day later than originally scheduled due to high wind conditions at one of the emergency landing sites. A leak was detected shortly after liftoff, and there was a concern that this might affect Shuttle landing.

The STS-76 Space Shuttle mission officially ended on Sunday, March 31, with a 13:29 UTC landing at Edwards Air Force Base, California. Unpredictable weather at the Kennedy Space Center forced mission controllers to land the Space Shuttle Atlantis at the backup Edwards landing site.

This mission also carried on-board the Shuttle Amateur Radio Experiment (SAREX). SAREX is a secondary payload which provides the opportunity for school groups and ham radio operators to talk to the astronauts while they are in orbit.

Unfortunately, the Shuttle Crew was too busy with the primary payload (Shuttle/MIR) activities to support SAREX operations during the first five days of the mission. Due to bad weather at the Cape and a couple of fronts coming through NASA managers decided to cut the STS-76 mission a day short.

Unfortunately the compression of the mission timeline to land a day early resulted in the cancellation of the five school group contacts that had been planned late in the mission. The crew had three days of packing up everything and preparing the shuttle for entry squeezed into two. So they were rather busy and the secondary SAREX payload got dropped in priority. The SAREX team will be working with these school groups to reschedule their contacts on a future flight.

Astronaut Shannon Lucid is now a member of the MIR crew for the next 4 and a half months. When her seat-liner and spacesuit were transferred over to Mir she became a member of the Mir 21 crew. And she's even changed her clothing from the shuttle's clothing to the Mir crew's clothing! So technically she's a resident aboard a Russian spacecraft, and subject to their rules and regulations.

The Russians have approved her use of the MIR radio on the 2 meter amateur band, with the call sign RØMIR. Look for Lucid from MIR on 145.55 simplex as she passes over the United States.

Several amateur radio operators around the world have already reported hearing her from Mir and working her on 145.55 MHz simplex. She will be a resident of the Mir space station until August. (Thanks KA3HDO)

AMATEUR RADIO OPS TO JOIN ALIEN SEARCH

(The following news item was downloaded from the *Electronic Telegraph* website in the UK)

The search for alien civilization takes on a new dimension this month when the first "radio hams" take part in the project.

The searches are being coordinated by the SETI (Search for Extra-Terrestrial Intelligence) League, based at Little Ferry, New Jersey, which hopes to have up to \$5,000 amateur radio operators around the world scanning the skies.

"Their equipment will be able to do these searches systematically while it does other things at the same time," said the League's executive director Dr. H. Paul Shuch. "We hope to achieve virtually free of charge what NASA was spending \$6 million a year on before its funds for alien searches were cut off by Congress in 1993."

The only equipment radio amateurs need to conduct searches is an antenna nine feet wide or more, a radio of sufficient sensitivity and a computer with software that the league provides.

Such equipment, the league believes, would be capable of detecting an alien radio signal out to a distance of several hundred light years.

The search for alien civilizations, which is everywhere privately funded, has until now been conducted only by big radio telescopes which are few in number and can cover only a small fraction of the sky at a time, about one part in a million.

But with thousands of radio hams conducting the search simultaneously, pointing their antennas at the same angle as the Earth rotates, a large part of the sky can be covered. (SETI website: <http://www.seti-inst.edu/>)

"FREEMEN" GROUP USE AMATEUR RADIO

The anti-government "Freeman" group at press time were still holed up at their remote 960 acre sheep ranch near Jordan, Montana. They believe they are "Christian Patriots" and reject the federal government. They consider their Justus Township an alternative government.

An Associated Press article out of Billings, Montana, quotes a Spokane (Wash.) newspaper report that Freeman leaders, LeRoy Schweitzer and Daniel Petersen, Jr., were arrested by an undercover FBI agent posing as a ham radio antenna installer who had gained their confidence.

"The Freeman, who use ham radios to exchange information and messages, wanted to erect a radio antenna on the hilltop near the farm buildings where they have been holed up, the Spokesman-Review reported."

Every year on April 1st., we get an assortment of **April Fools Day** news stories. Here are some excerpts from the most novel. (Remember, this is just a joke!)

ITU ANNOUNCES IMMEDIATE AUCTION OF ENTIRE ELECTROMAGNETIC SPECTRUM

Geneva (April 1). The International Telecommunication Union (ITU) today announced that it was selling the entire set of frequencies of the electromagnetic spectrum in order to provide a permanent endowment for the United Nations family of organizations for the indefinite future.

"We've learned a lot from our American colleagues at the FCC, said a spokesperson for the ITU. Their spectrum allocation auctions have convinced us that the capitalist model is superior to our established ways of allocating spectrum. We realized that we could improve on their model by extending the auction to include all frequencies, not just those for narrow communication purposes."

As might be expected, initial bidding activity has been fiercest in the visible frequency range. An anonymous source has reported that IBM has been bidding in excess of U.S. \$50 million for the rights to exclusive use of Pantone 3462, otherwise known as IBM Blue.

Cosmetics manufacturers are fighting fiercely for rights to use approximately 218 different very narrow frequency ranges in the reds, ensuring uniqueness for their extensive collection of lipsticks and other cosmetics.

In a bold move to preserve financial stability, the U.S. Government immediately appropriated the U.S. dollar green part of the spectrum to protect the integrity of its money supply.

Vladimir Zhirinovsky, a leading contender for the Russian Presidency, said, "Red is our heritage, our birthright! You can auction all the other frequencies in the spectrum, but after I win the next election I shall take this matter up immediately and most forcefully with your Governing Body!"

Manufacturers of prisms for physics instruction were aghast at the thought of having to produce prisms that displayed only those specific colors for which no bid was obtained or accepted. The National Council of Scientific Instrument Manufacturers has stated its intent to petition the National Science Foundation to create an Acceptable Use Policy that would allow unrestricted use of the visible part of the spectrum for instructional purposes only.

A resale market for frequencies has rapidly developed. The Chicago Commodities Exchange has announced that it is making a primary market in frequency rights, and trading has begun. At press time, October yellows in the 3.34-3.50 THz range were quoted at \$2.50 bid and \$2.625 asked per angstrom, with 146 contracts already finalized. Christmas season reds and greens have quadrupled in price since the market opened, and traders are anticipating vigorous market activity later this year.

ITU officials were very pleased with the results of the auction so far, declaring that the revolution had just started. Said one ITU representative, "With this auction we've only affected the space impacting one of the five human senses. We're currently looking into the ownership of rights to the audible frequencies and olfactory space, and we hope to proceed with another offering very soon."

AMATEUR RADIO STATION CALL SIGNS

...sequentially issued as of the first of April 1996:

Radio District	Gp."A" Extra	Gp."B" Advan.	Gp."C" Tech/Gen	Gp."D" Novice
0 (*)	AB0BK	KI0BZ	(****)	KB0VVJ
1 (*)	AA1PT	KE1EJ	N1WYA	KB1BXX
2 (*)	AB2AN	KG2GJ	(****)	KB2YKO
3 (*)	AA3OA	KE3WE	N3XCV	KB3BOC
4 (*)	AE4SO	KT4NS	(****)	KF4IGS
5 (*)	AC5HD	KK5YM	(****)	KC5TRQ
6 (*)	AC6TR	KQ6EX	(****)	KF6CPF
7 (*)	AB7PX	KJ7WN	(****)	KC7QDU
8 (*)	AA8PX	KG8WF	(****)	KC8DBC
9 (*)	AA9RQ	KG9FY	(****)	KB9NEA
N. Mariana	KH0V	AH0AW	KH0ER	WH0ABE
Guam	WH2T	AH2DB	KH2PY	WH2ANP
Johnston Is.	AH3D	AH3AD	KH3AG	WH3AAG
Midway Is.		AH4AA	KH4AG	WH4AAH
Hawaii	(**)	AH6ON	(****)	WH6DAN
Kure Is.			KH7AA	
Amer.Samoa	AH8O	AH8AH	KH8CL	WH8ABF
Wake W.Peale	AH9C	AH9AD	KH9AE	WH9AAI
Alaska	(**)	AL7QI	(****)	WL7CSK
Virgin Is.	WP2X	KP2CJ	NP2JD	WP2AIC
Puerto Rico	(**)	(***)	(****)	WP4NKU

* = All 1-by-2& 2-by-1 call signs have been assigned.

** = All 2-by-1 call signs have been assigned.

*** = All KP4-by-2 call signs assigned in Puerto Rico.

**** = Group "C" (N-by-3) call signs have now run out in all but the 1st and 3rd call district.

[Source: FCC, Gettysburg, Pennsylvania]

NEW AND UPGRADING AMATEUR STATISTICS FOR THE MONTH OF MARCH - 1996

License Class	New Amateurs	Upgrading Amateurs
Novice	140	0
Technician	2841	0
Tech Plus	289	570
General	31	540
Advanced	4	342
Extra Class	0	325
Club	116	0
Total	3424	1777

• **Special Event Operation - The Foundation for Amateur International Radio Service (FAIRS)** is an international foundation with many countries doing volunteer work. The Foundation will celebrate its 5th anniversary with special events stations operating in the USA and in several foreign countries. KK4WW, US5WE, BY1QH, 8R1WD and S21AM will operate in their own countries on May 11th and 12th in the General portion of 40, 20, and 15 meter ham band. For large wall certificate send QSL and 9x12 inch SASE envelope to FAIRS, P.O. Box 341, Floyd, VA 24091

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FCC DENIES W5YI PETITION ON ONE-WAY BULLETIN BROADCASTS ON HF HAM BANDS

The FCC has denied the W5YI Petition for Rulemaking which sought to transfer all information type broadcasts to the VHF and higher frequency bands. The Commission said they received 391 comments which overwhelmingly opposed the proposal.

"While there may be some disagreement about the propriety of conducting one-way transmissions on frequency bands that have long-distance propagation capability, it appears that many amateur operators rely on such transmissions to obtain information bulletins of interest to the amateur service, as well as for learning and improving their proficiency in telegraphy."

Still unanswered is the question as to the appropriateness of HF amateur bulletin broadcasts - such as those by K1MAN - that appear on many HF bands simultaneously without first determining frequency occupancy. We are considering asking for a clarification.

ARRL FILES COMMENTS ON IMPROVING COMMISSION PROCESSES - DOCKET No. 96-17

The ARRL has filed reply comments on a Notice of Inquiry by the FCC's Office of Plans and Policy. The NOI asks the public to submit ideas which would permit them to do a better job with less resources. The ARRL believes that "Any necessary Commission delegation of regulatory functions involving the Amateur Service should be made to the League, a not-for-profit association with the capability and wherewithal to provide such services without the imposition of unnecessary or burdensome costs on the Amateur Radio community."

The League criticized our suggestion that "...Volunteer Examiner Coordinators (VECs), which are currently limited by statute to recovery of expenses (up to a per examination fee ceiling) from examination candidates, be permitted to charge additional fees for additional services. [W5YI] suggests, first, that amateur license renewals and modifications could be handled by VECs, rather than the Commission. Data entry could be done by the VECs, who would forward that information to the Commission electronically."

The League said this function could not be delegated without statutory authority which does not now exist. Furthermore, the League believes that there is no justification for the privatization of license modifications or renewals and that this function "...is not a significant burden on the Commission..."

We also suggested that the Vanity Call Sign assignment program could be privatized. The ARRL said such a program would not save the FCC anything. Furthermore, the conclusion of a "PRB-3" inquiry determined that a privatized system was not the best method of proceeding; rather, the Commission-administered Vanity Call Sign program was established instead."

"Finally, Maia proposes that no paper licenses be issued by the Commission in the Amateur Service. He suggests that license data be posted on the Internet, and that anyone who desires a paper license may obtain one from a VEC (for yet another fee). Maia's suggestion fails to recognize the need for Commission-issued licenses evidencing Federal licensing." The ARRL again said that if the FCC cannot sustain the printing and mailing of licenses, then "...the only proper delegatee of the task is the League, and the League alone."

"The League vehemently opposes ...the delegation of proper Commission functions to multiple-source, unregulated entrepreneurs with no reporting requirements or significant Commission oversight, whose interest in assumption of those functions is purely pecuniary gain."

The League says it "...recognizes that the FCC is faced with severe budget restrictions and is forced to reexamine its functions..." and "...welcomes the opportunity to discuss ...additional ways in which the League could assist the Commission in the administration and regulation of the Amateur Service."

FCC ORDERS HAM LICENSE CLASS REDUCTION

The FCC has denied a request by Arthur P. Baumgarden, K17CW of Bingen, Washington for a full Commission review of a decision by its Private Radio Bureau. The Bureau had previously determined that Baumgarden was not properly examined for the General and Advanced Class amateur operator license on April 27, 1994.

The FCC said that Baumgarden had told a Commission informant shortly after the supposed examination that he obtained his upgraded (General/Advanced) amateur operator licenses though the payment of money without passing the required examinations. The informant notified the FCC of the irregularity and an investigation followed.

The Bureau determined that due to impossible travel times (2 days) and driving distances (2,000 miles round trip) it was not possible for Baumgarden to have been administered the required examinations in Carson, California. Baumgarden also changed his version on how such a trip was possible. The FCC noted that the needed examinations were widely available in his Washington state area.

The FCC ordered Baumgarden to appear for telegraphy examination element 1B (13 wpm) and written element 3(A) and 3(B) retesting. Instead, Mr. Baumgarden filed a petition for reconsideration of that order which was denied on September 15, 1994. He then requested a full Commission review of the Bureau's actions.

Baumgarden's request was found to be "procedurally deficient" since it failed to meet the minimum criteria for such a review. His Application for Review was denied on both procedural and substantive grounds.

The FCC has now ordered that Baumgarden's operator license be reduced from Advanced to the Novice Class and that he be issued a Group D call sign consistent with the Novice Class. (FCC action: March 18, 1996.)

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- **SAREX FLIGHTS** for the remainder of the year:
STS-78/LMS/Columbia: 6/27/96, 16 days. Astronauts Susan Helms KC7NHZ, Charles Brady N4BQW, Canadian Robert Thirsk VA3CA, Luca Urbani KC5RGF & Pedro Duque KC5RGG.
STS-79/MIR Docking Flt-4/Atlantis: 8/1/96, 9 days. Jay Apt N5QWL & Jerry Linenger KC5HBR
STS-80/Columbia: 11/7/96, 16 days. Ken Cockrell KB5UAH & Tammy Jernigan KC5MGF.
STS-81/Mir Docking Flt-5/Atlantis: 12/5/96, 9 days. Crew to be announced.

RESIDENTIAL ISDN DIGITAL PHONE LINES BECOMING A MASS MARKET PRODUCT!

The race is on. The objective is to deliver data (especially graphics) fast! It seems hard to believe, but only 20 years ago, the standard for over-the-phone line was an analog 300 baud rate. Then came 1200, 2400, 9600, 14.4K and within the last year or so, 28.8K. That's about as far as analog can take you.

Depending upon whose figures you believe, there are some 25 million PC users swapping information over the phone lines. Most have 14.4K bit/sec. analog modems.

Driven by the explosive growth of the Internet's World Wide Web, tens of thousands of PC enthusiasts are migrating to the dial-up Integrated Services Digital Network ...or ISDN as it is more commonly called. ISDN lets you connect to the Internet at up to 128K bits/sec. And since it is part of the regular telephone network, you can use it for other things too - such as faxes and voice.

Mathematically that's more than nine times faster than a 14.4Kbs analog modem. In actual practice, however, ISDN is about twelve times faster since analog phone lines are only 75% reliable for data transfer whereas digital lines come close to 100% efficiency. Analog modems require extensive "call set up" time (about 30 seconds or more), digital modems do not. ISDN connections are usually made in 5 seconds or less.

Just what is ISDN?

In a nutshell, ISDN is a hardware/software combination that permits digital signaling over regular copper "twisted pair local loop" telephone lines.

ISDN is not new. It has been around for some ten years now. But it is just now catching on. Some online services, such as the Microsoft Network (MSN) and CompuServe offer ISDN connections.

There are two types of ISDN lines; Primary Rate Interface (PRI) and Basic Rate Interface (BRI.) PRI is newer, faster, more expensive and not widely used. BRI accounts for 98 percent of all ISDN hookups.

At the end of 1995, more than 450,000 ISDN Basic Rate Interface lines were in service. Bell Atlantic (800-337-6008) leads in the number of ISDN lines installed (145,000) and is adding about 6,000 new ISDN

lines a month. Here are the toll free phone numbers of the other Bell operating companies: Ameritech 800-832-6328, Bell South 800-428-4736, Nynex 800-438-4736, Pacific Bell 800-472-4736, Southwestern Bell 800-792-4736 and US West 800-246-5226. (4736 translates to ISDN on your keypad.) 450,000 ISDN lines may seem like a lot, but this is still less than a half percent of the nation's 120 million regular phone lines.

Telephone companies have been going digital for some time now and most local phone companies offer ISDN. You can call the Intel ISDN hotline (toll free 1-800-538-3373, extension 510) to find out if your area code and exchange (first three digits of your telephone number) has it available.

The biggest problem has been getting a digital connection from the phone company to the home. Some phone companies may not be able to provide ISDN service since your office or home must be within 5 miles of their digital switching equipment - the so-called 18,000 feet limitation. A repeater can amplify and extend this limit somewhat.

Over 70 percent of the U.S. has ISDN service available now and you may have to wait up to a month to get it due to a backlog of orders. An installer will come to your home and install an ISDN jack and test it. There will be two charges - an installation charge (from \$50 to \$300) and a monthly rate somewhere in the \$30 to \$50 range. Business owners are charged substantially more! Prices are actually all over the lot since ISDN is not only offered by the seven Bell operating companies but various independent and long distance telephone companies as well. As volume goes up, prices are coming down.

Dial up ISDN Basic Rate Interface (BRI) service consists of two 64K bit/sec. "B" channels to haul data and voice traffic and one 14K bit/sec. "D" channel to handle low speed packet data and network "housekeeping" instructions. You can also do two things at once on the same ISDN line - such as making a voice call with a digital phone while surfing the Internet. (Each channel comes with its own phone number.) The two 64K bit/sec. channels can also be bonded together to form one 128K bit/sec channel.

Check to be certain your Internet Service Provider offers ISDN access. Some ISPs offer complete packages which even includes the needed hardware and the ordering and installing of the ISDN line. If this service is available, use it! It will save you the headache of getting configured!

You also need to obtain and install an external ISDN digital modem to your serial port ...or an adapter card in your PC that operates via a COM port. An ISDN hookup works without attention just like a standard modem - that is once you get it set up. Expect to pay about \$500 for your hardware. But, with volume, the price should fall to the \$200 range within a couple of years.

Here are some ISDN websites on the Internet:
<http://www.alumni.caltech.edu/~dank/isdn> --
<http://techweb.cmp.com/techweb/nwc/isdn> - and
<http://pclt.cis.yale.edu/pclt>.

Cable modems are faster yet!

There is a question whether ISDN will be as popular as cable modems once they are deployed in a couple of years. Cable modems can operate at 30 to 40M bit/sec. On the surface this appears to be "1000 times faster" than a telephone modem, but that is misleading. Real world throughput is much lower and depends on how many other customers are communicating over the channel and the type of traffic being handled. One thing is certain, however; cable modems are substantially faster than telephone and ISDN modems.

And ADSL and other formats are on the way!

A new digital format line is supposed to become available by year end. ADSL (for Asymmetric Digital Subscriber Line) was originally developed for video-on-demand but technically couldn't handle it. But it works just fine for data.

Like ISDN, ADSL runs over an ordinary copper voice grade telephone line at a downstream (receive) speed that is ten times faster than ISDN. And a new ADSL-2 modulation scheme allows up to 6.1M bits/sec, 640K bits/sec upstream.

And the April 1st issue of *Business Week* reported that Canada's Northern Telecom has a less expensive digital telephone line format coming that can receive data at 2M bits/sec., and send it at 50K bits/sec.

U.S. POSTAL SERVICE TO TRACK DELIVERY VEHICLES VIA GLOBAL POSITIONING SYSTEM

Using technology that was originally developed in the Amateur Radio Service, the United States Postal Service has a new initiative known as GPSD. The "Global Positioning System for Delivery" is a satellite tracking system for postal service vehicles ...the same little white USPS vans that run up and down the street making residential mail deliveries.

The Global Positioning System(GPS), developed by the Department of Defense at a cost of over \$12 billion, is based upon a constellation of 24 satellites orbiting 11,000 miles above the earth. Also called Navstar, GPS uses multiple satellites to provide worldwide positional fix capability. This is accomplished by measuring the propagation time of multiple satellite signals received at the GPS receiver and is the most accurate and reliable radio navigation and positioning technology ever produced. Use of the GPS network is free of any charge to the user.

Global Positioning System For Delivery(GPSD) is a Postal Service developed system designed to support delivery needs of the future. A complete GPSD system consists

of a miniature communications device, a GPS receiver and a small PC. This integrated system is then installed in a postal vehicle.

Application software collects and manages the data received from the GPS receiver. GPSD uses time, longitude and latitude, to instantly pinpoint and log the vehicle's position, speed and heading. The advantages of a GPSD system will enable the USPS to expand fleet management, tracking and tracing, and on-demand pickup and delivery down to the street level.

The pilot GPSD program is being conducted at the main Arlington, Texas post office ...the same P.O. that this newsletter is mailed from! We have been watching technicians from RSI (Radio Satellite Integrators, Inc. of Torrance, CA) install the components that make up the system. Brian Burda, RSI's Vice President of Technology and USPS's John Frisby, project coordinator gave us a tour of the facility and an update of GPSD program development last week.

The low cost system uses the GPS and 220-MHz spectrum to notify central Post Office locations of the exact location of its various route delivery vehicles. Standard GPS accuracy is around 50 meters, but we were told of methods that obtain position accuracies of 5 meters and less! A prototype system of two postal vehicles has been completed, tested and are already operating on Arlington streets. Twenty-eight more are scheduled to be outfitted by April 27th - for a total of thirty.

Here is how it works. Each postal vehicle is equipped with a small, flat rectangular GPS antenna on its roof which is lashed to a GPS receiver. A 220 MHz SEA 2-channel marine radio and a 1 1/4 meter base-loaded antenna complete the vehicle electronics. The ASCII output of the GPS receiver is fed to the 220-MHz radio.

The transceiver and antenna are similar to what amateurs used when 220-222 MHz was still a ham band except that the emission is AM rather than FM. The USPS is using 220.5575 MHz for data, but ultimately a second channel (at 221.5575 MHz) will be added for base-to-mobile voice communication.

A complete system can be assembled including communications, for approximately \$1500 per vehicle. GPSD will begin as a simplex operation but range will ultimately be increased with a repeater system. Its antenna will be atop a City of Arlington tower. Arlington is also interested in the technology which could be extended to its own police, fire and other city-owned vehicles.

The postal vehicle is automatically polled by the main post office every 5 seconds! Each vehicle in the program is also equipped with a "panic button." This device provides an emergency switch for carriers to notify station management in the event of accidents, fire, medical needs - carrier or customer, assault, robbery or any situations requiring immediate 911 assistance. Once actuated, the polling stops and all communications is directed to the

driver who triggered the panic button. In the future, this feature can be expanded to include notification of vehicle break downs, out-of-gas and less threatening situations.

The equipment at the post office dispatch point is another 220 MHz radio and an RSI interface to PCs loaded with Windows 95-based mapping software. Another PC displays the raw GPS output from the postal vehicle. Each vehicle appears as a moving dot on a full color road map. You can watch all GPS-equipped vehicles on a larger computerized map ...or you can zoom in on a single vehicle. The USPS estimates that a complete GPSD setup costs less than 25 cents per vehicle per day.

It was interesting watching a demonstration of vehicles going up and down Arlington, Texas streets. The resolution is so good that you can actually see the postal vehicle go down a street on one side, making stops at each house and then turn around to deliver to mailboxes on the other side of the street!

GPSD is also an excellent supervisory tool and practically eliminates the need for the USPS to do manual street observations. The Electronic Surveillance Act (ESA) provides for routine supervisory monitoring. Thus, the USPS knows exactly where all of its resources are at all times.

The objective of the GPSD initiative is twofold. The security of the postal driver and mail is paramount. The second purpose is to track and trace mail delivery and USPS vehicles. The program can eventually be expanded to include automatic real-time notification of any mail that requires a signature.

ARRL DEFENDS SPREAD-SPECTRUM PETITION

The FCC has no shortage of amateur views when it comes to ARRL petition RM-8737. The petition, filed December 12, 1995, would change certain Part 97 rules to make it easier for amateurs to develop spread spectrum technology (see Jan 15, 1996 W5YI Report, page 9)

Digital experimenters generally supported the thrust of the ARRL petition, but frequency coordinators and some VHF/UHF operators took strong exception to it. Some opponents suggested that spread spectrum will bring criminal activity to the ham bands, and that the "chilling effect" of current restrictive rules has beneficially discouraged spread spectrum activity.

ARRL replied that the problem it seeks to address "is not too much spread spectrum in the Amateur Service. The problem is not enough spread spectrum experimentation."

"Many of the commenters are seized with protecting their existing narrow-band operations, and are concerned (unnecessarily) about increased noise levels in bands used by narrowband modes, rather than promoting spread spectrum for the benefits, including spectrum efficiency, that it can provide," the League said in reply comments.

"[S]ome voices speak in favor of even greater restric-

tion and mandatory control. The imposition of additional constraints would guarantee that the Amateur Service will not be able to keep up with spread spectrum developments in Parts 15 and 90 of the Commission's rules, and will be prevented from maximization of spectrum efficiency in its own bands."

Part 15 allows unlicensed use of spread spectrum devices at low power levels. These are mostly cordless phones and data transceivers for in-building and local area communication.

Part 90 Rules allow spread spectrum for police use and in the Location and Monitoring Service (LMS) for tracking and identification of vehicles. (A Canadian company is seeking FCC permission to use LMS to locate lost children at theme parks and zoos!)

ARRL said that opponents proposed non-standard definitions of interference and detailed regulation of spreading codes -- which it believes are not needed. "They have introduced comparisons of spread spectrum and narrow-band power densities that show spread spectrum in the worst possible light without documenting either the benefits in frequency re-use permitted by spread spectrum emissions, or the spectrum inefficiency of FDMA systems."

Frequency re-use refers to the ability of spread spectrum systems to use the same frequency throughout a geographic area without self-interference, because simultaneous QSOs are not separated in frequency but rather by the mathematical codes with which they are transmitted. Frequency Division Multiple Access (FDMA) refers to the conventional scheme of separating radio transmissions by frequency.

ARRL took particular aim at comments of the Southern California Repeater and Remote Base Association (SCRRBA): one of the most intense of the parties filing against the ARRL petition.

"In its comments...SCRRBA seeks to delete the word 'harmful' before 'interference' 'unless the SS station is utilizing a frequency and bandwidth recommended by a local frequency coordinator, in which case the two station licensees are equally and fully responsible for resolving the interference,' the ARRL said.

ARRL noted that the term "harmful interference" has a "standard, internationally understood meaning." Deleting the word "harmful" would, according to ARRL, "have the effect of making any alleged interference attributable to spread spectrum emissions a Rule violation. This would apply even to unintentional triggering of carrier operated receiver squelch. It would also require local frequency coordination, now mandatory, prior to any spread spectrum experimentation, which would be an unacceptable and unprecedented imposition on spread spectrum users."

SCRRBA had proposed that amateurs identify spread

spectrum emissions at maximum power. "This is indeed absurd," ARRL replied, "and completely contrary to the spirit of the present Section 97.313(a), which requires the minimum power necessary to conduct the communications."

Excerpts from Other Reply Comments

"AMSAT believes that spread spectrum operation should be encouraged. We believe that it will eventually prove valuable for both terrestrial and satellite applications."

"However, we contend that it should be restricted to certain frequency segments so as to offer minimal interference to other satellite, EME or terrestrial operation, while still allowing experimentation. ...In particular, AMSAT contends that spread spectrum should not normally be allowed below 450 MHz."

"We are aware that the current rules allow spread spectrum operation above 420 MHz, and have since 1985. It may be argued that the fact that spread spectrum has been authorized in the 420-450 MHz band for over ten years, with no reports of interference recorded, proves that it poses no threat to satellite operation, EME or weak signal terrestrial work. However, AMSAT cites ARRL's own words in Para. 2 of their Petition from which we quote:

'Since the time spread spectrum communications were first authorized in the Amateur Service in mid-1985, there have been some experimental amateur operations using spread spectrum techniques, but its use has not been widespread.'

"AMSAT believes that this is an understatement and that spread spectrum use has been extremely limited. We submit that this is the reason why no interference complaints have been registered. Furthermore, AMSAT has seen no reports of tests conducted by those amateurs who were experimenting with spread spectrum that address its potential interference to satellite operation and other weak signal modes." - William A. Tynan, W3XO, President, Radio Amateur Satellite Corporation

"NPS takes particular exception to the Reply Comments submitted by Mr. William A. Tynan where he proposes that no spread spectrum communications should be permitted below 450 MHz. Clearly, this would have a major impact on the NPS PANSAT project."

"Such a drastic change in frequency use is unwarranted. Mr. Tynan's arguments of interference from spread spectrum systems are based on supposition, not fact. However, as they do manifest valid concerns among a group of amateur operators, these concerns should be addressed."

"PANSAT will actually be one of the satellite operations that Mr. Tynan is concerned about protecting, and is itself an experiment. ...It is NPS' position that spread spec-

trum communications should be less restricted and opened to 50 MHz and above." - Daniel Sakoda, KD6DRA and Rudolf Panholzer, Naval Postgraduate School (NPS), PANSAT amateur spread spectrum satellite program

"I strongly support the liberalization of the spread spectrum rules as proposed by the ARRL. I believe this technology has much to offer the Amateur Service. The potential direct benefits include substantial increases in the efficiency and quality of existing services (e.g, mobile voice communications) as well as enabling qualitatively new applications such as very high speed packet radio. ...

"So I am considerably distressed by the negative comments received so far in this action. They exhibit a remarkable degree of ignorance of the principles of spread spectrum and of basic communications theory, a strong fear of the unknown, and an unreasonable desire to maintain the status quo at all costs in a rapidly changing world."

...

"To the extent that any of the comments contain actual numerical analyses, all are based on absolute-worst-case conditions. They assume continuous use by the spread spectrum station of the maximum power of 100 watts, completely discounting the mitigating effects of duty cycle and automatic power control. They assume reckless and total disregard on the part of the spread spectrum operator for voluntary bandplans and interference complaints from nearby narrowband operations. Then they argue that because interference could occur under such extreme conditions, spread spectrum ought to be banned entirely or at most permitted under extremely restrictive rules." - Philip R. Karn Jr., KA9Q

"The Secretary of Defense, in his capacity as Executive Agent of the National Communications System, continues to believe the proposed changes have merit and will advance the usage of spread spectrum technology. It is urged that the Commission issue a Notice of Proposed Rulemaking proposing the League's changes." - Manager, National Communications System, Defense Information Systems Agency

"TAPR congratulates the ARRL for its forward-looking proposal to liberalize the spread spectrum rules in the Amateur Radio Service. ARRL's proposal, if adopted, could provide a variety of benefits to both members of the amateur service community and to the wider public."

"Proposals to modify the status quo often generate opposition by those who are adequately served by it. Like the turmoil that occurred in the Amateur Radio Service during the transition from AM to SSB, the growing use of spread spectrum in the Service will not be without incidents of disagreement and misunderstanding. For this reason, TAPR intends to use its resources during the rule-

making process to educate the Amateur Radio community on the theory, application, and practice of spread spectrum technology.

"Yet while fear and opposition are understandable, they should not be permitted to stifle new developments. In light of spread spectrum's strong track record and proven benefits, unsubstantiated claims of potential interference should be discounted and the Commission should act promptly to issue a Notice of Proposed Rulemaking." - Dewayne Hendricks, WA8DZP, Tucson Amateur Packet Radio Corp.

SHOULD PRB-1 BE STRENGTHENED?

The ARRL petition RM-8763, filed February 7, proposed to expand protection of amateur antenna structures (see March 1, 1996 W5YI Report, page 1). ARRL argued that existing Part 97 rules on local regulation of antennas (often referred to as "PRB-1") have not worked as well as needed in order to keep local regulations and deed restrictions from inhibiting amateur station construction and operation.

Some amateurs stress the need for a better PRB-1, but not everyone is enthusiastic about the idea. Here are excerpts from some of the most interesting comments received at the FCC:

"Hams in my city of Irvine, California, require relief from restrictive city zoning and exclusionary deed restrictions as applied to outdoor antennas. ...If one wants to live near work to avoid traffic snarls and desires good schools for one's children, then Irvine, in my opinion, is the place to live in Orange County. However, one should not be forced to give up amateur HF communications to live in 95% of our residences nor be subjected to burdensome zoning to live in the remaining 5%, in order to obtain these social benefits.

"Paradoxically, in this large residential market in central Orange County, there is really no way for a radio amateur to avoid deed problems with any residence of recent construction. As far as I'm concerned, our communities would be better served by more amateur residential stations rather than less of them. Deed restrictions at odds with federal communications policy should be tempered. ...Please tighten up PRB-1." - Jeffrey E. Sudeith M.D., KOJS, Irvine CA

"The League is acting on behalf of those amateur radio operators who either do not wish to acquire the skills necessary to make a lot of amateur radio contacts. Or feel their expensive ham gear plus a really high antenna structure, not less than 70 feet high, will per se make acquisition of such contacts in large numbers with stations at great distances, an ongoing, continuous reality. ...

"If granted, the petition will assure the FCC a moun-

tain of unnecessarily extra paperwork, which is exactly what it is trying to avoid. The petition will also generate a plethora of law cases, some addressed to the FCC or the petition itself, perhaps to its unconstitutionality. Other cases may involve the FCC in court battles between amateur radio operators and community zoning boards, etc., all due to the amateurs' citation of the 'new' and enhanced PRB-1 the petition seeks. All of this is totally unnecessary and serves no useful purpose for the amateur radio operators, for the FCC or for the public." - Karl A. Kopetzky, K9AQJ, "Voice of Ham-Reason"

"It has been my experience for the past six years as ARRL Local Government Liaison, and now State Government Liaison for the NYC/LI Section in the ARRL Hudson Division that some amateurs are faced with the prospect of a lawsuit in order to install an effective antenna system. Most of the time when local government has an ordinance on the books which limits the height of any structure...the amateur is not financially able to challenge a denial of a variance in court.

"In most cases he or she simply does not have the money for legal expenses so gives in and either finds another hobby or settles for a dipole or vertical. I am also aware of instances where towns have even challenged verticals and dipoles which exceeded their height requirement of about thirty feet. City Hall has unlimited financial resources to enforce its restrictive ordinances - tax dollars. ...I strongly urge you to strengthen PRB-1 in the ways outlined in the ARRL's request for rule making." - Francis J.T. Fallon, N2FF, Radio Amateur Defense and Information Organization Inc., Williston Park NY

"In seeking to establish an antenna height of 70 feet in residential neighborhoods as 'reasonable' and urging the Commission to deploy its preemptive powers to strip from localities and even states any defense against the erection of such monumentally-intrusive structures in such neighborhoods across the country, the League violently assaults the property interests of millions of Americans. ...

"To encourage sympathy for its strategy, the Petition suggests that the Service is made up of public benefactors, hampered, harassed and financially punished by short-sighted, ignorant local governing bodies who simply do not understand their selfless urge to serve.

"In fact, Amateur Radio is merely a hobby pursued primarily, and in most cases exclusively, purely and simply for avocational enjoyment. Public service is only incidental. Emergency services (including training and actual emergency communications) are actually rendered by a small minority of these hobbyists and, by these, for only a part of their operating time. ...Commentor asks that the Commission deny and dismiss the Petition in its entirety." - Douglas A. Nelson, Lookout Mountain, TN